# Essence, Potentiality, and Modality

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**Abstract**

According to essentialism, metaphysical modality is founded in the essences of things, where the essence of a thing is roughly akin to its real definition. According to potentialism (also known as dispositionalism), metaphysical modality is founded in the potentialities of things, where a potentiality is roughly the generalized notion of a disposition. Essentialism and potentialism have much in common, but little has been written about their relation to each other. The aim of this paper is to better understand the relations between essence and potentiality, on the one hand, and between essentialism and potentialism, on the other. It is argued, first, that essence and potentiality are not duals but interestingly linked by a weaker relation dubbed 'semi-duality'; second, that given this weaker relation, essentialism and potentialism are not natural allies but rather natural competitors; and third, that the semi-duality of essence and potentiality allows the potentialist to respond to an important explanatory challenge by using essentialist resources without thereby committing to essentialism.

## 1. Introduction

According to essentialism, metaphysical modality is founded in the essences of things, where the essence of a thing is roughly akin to its real definition (Fine 1994, Hale 2013, Lowe 2012). According to potentialism (also known as dispositionalism), metaphysical modality is founded in the potentialities of things, where a potentiality is roughly the generalized notion of a disposition (Vetter 2015, Jacobs 2010, Borghini and Williams 2008)[1]. Essentialism and potentialism have much in

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[1]The authors mentioned in parentheses use the term 'dispositionalism' or 'powers theory'. 'Potentialism' is, to the best of my knowledge, first used in Wang 2015 to refer to the version of the view that I propose in Vetter 2015.

common. Both are realist accounts of metaphysical modality, taking modality to be a genuine feature of reality. Both are actualist, and indeed 'hardcore actualist' theories (Contessa 2009; see also Vetter 2011 and Borghini 2016): they account for modality by appeal only to the inhabitants of the actual world, and have no need to invoke other possible worlds anywhere in their metaphysics of modality. Both, finally, account for modality in what we can call a 'localized' manner (Vetter 2015): they locate modality not just in the actual world, but in the way that individual things are – either essentially or potentially.

But there are also important ways in which essentialism and potentialism differ from each other.

*Essentialism* gives a direct account only of necessity: it is necessary that *p* just in case it is true in virtue of the essence of all objects taken together that *p* (Fine 1994); or alternatively, it is necessary that *p* just in case there are some objects X such that it is true in virtue of X's essence that *p* (Hale 2013); or alternatively, it is necessary that *p* just in case there are some objects X whose basic nature entails *p* (Correia 2012).[2] Possibilities, on this view, do not require a positive account: the possible is simply that which is not necessarily not the case. Possibility marks that which is left open, which is not settled by the essences of things. Accordingly, essentialists are sometimes charged with producing too few necessities, and leaving too many possibilities open (Cameron 2008).

*Potentialism*, on the contrary, gives a direct account only of possibility: it is possible that *p* just in case there are some objects X which have, had or will have an iterated potentiality for *p* (where an iterated potentiality is, roughly, a potentiality for further potentialities; see Vetter 2015, 135-139, Borghini and Williams 2008, 30). Necessities, on this view, do not require a positive account: the necessary is simply that which is not possibly not the case. Necessity marks the boundaries of potentiality, it arises where potentialities give out. Accordingly, potentialists are sometimes charged with producing too few possibilities, and having to accept too many necessities (Cameron 2008, Wang 2015, Leech 2017).

Another interesting, but harder to pin down, difference between the two accounts is the emphasis that they put on different aspects of modality.

*Essentialism* makes sense of our philosophical concern with modality: many philosophical questions are questions about essence, and since essence gives rise to necessity it is often sensible to phrase those questions in terms of necessity. Essence has, unsurprisingly, been linked to other notions of philosophical importance, such as grounding, identity, and dependence (Fine 2015, Correia and Skiles

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[2]See Michels 2018 for a discussion of these different definitions. As Michels shows, they are equivalent, although there may be reason to favour one over the others. For my purposes, their differences will not matter.

2017, Jago 2018, Zylstra 2018b). Essentialists have had very little to say about our more everyday dealings with modality: what we can do in a given situation, or how things might have developed otherwise.

*Potentialism*, on the contrary, is more closely aligned with our everyday, ordinary concern with modality: it stresses the link that modality has with our own abilities and the dispositions of the things around us, both of which are of paramount importance in everyday life (how would we decide whether to do one thing or another if we did not know about our own abilities to do the one or the other?). Potentiality has, accordingly, been used to provide a semantics for ordinary modals like 'can' (Vetter 2013). But it has, in turn, had less to say about those philosophical concerns with modality that are further remote from ordinary modal thought, such as the role of modality in philosophical methodology, or its relation to metaphysical issues of material constitution and identity (see Thomasson 2018).[3]

Given their shared concern to ground metaphysical modality in the things of the actual world, and their complementary strengths and weaknesses, it may be thought natural that the two accounts be combined to their mutual benefit. After all, might we not think of essence and potentiality as closely related, much like necessity and possibility are? I will argue below that the relation between essence and potentiality, while close, is not so close as to collapse the two accounts into two sides of the same coin; and that combining essentialism with potentialism is not an attractive option after all. But if they are not to be combined, then essentialism and potentialism are not so much natural allies as they are natural competitors.

My aim in this paper is to better understand the relations between essence and potentiality, on the one hand, and between essentialism and potentialism, on the other. The plan for the paper is as follows. §2 examines the relation between essence and potentiality and argues that they stand in an interesting relation which I call semi-duality, and which is much like duality but with only a one-way implication. The rest of the paper spells out consequences of this semi-duality. §3 argues that essentialism and potentialism are not usefully combined into a unified account of modality. §4 turns to an application of semi-duality in answering a challenge for potentialism (which I call 'the explanatory challenge') that might seem to put potentialism at a disadvantage vis-a-vis essentialism. I show how, given semi-duality, the potentialist can in effect utilize essentialist resources without thereby committing to essentialism. This does not settle the competition between essentialism and potentialism but it gives me the opportunity to outline how essence fits into the potentialist picture.

A note on terminology is in order before I begin. First, I will be talking about

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[3]Both essence and potentiality – the latter in the form of dispositions – have been argued to be at the centre of scientific investigations: see, e.g., Bird 2007, Ellis 2001.

essences in the objectual, not the generic, sense (Fine 2015, Correia 2006): that is, I will be speaking of things (singly or plurally) having essences, not of its being essential to x's being such-and-such that x be so-and-so. Since singular essence can be treated as a special case of plural essence (so-called 'collective essence'), I will use the plural variable X to stand in for both (and likewise in the case of potentiality). Second, I will informally be using both predicate and sentence operators for essence and for potentiality. Thus I will speak of something being essentially so-and-so, and of its being true in virtue of the essence of something that ...; and I will speak of something being potentially so-and-so, and of something having the potentiality for it to be the case that ... . (This is standard with regard to essence, but unusual for potentiality. We can think of a potentiality for it to be the case that *p* as a potentiality to *be such that p*, as I do in Vetter 2015; or else, as a potentiality to *bring it about* that *p*, with Yates 2015; or else, as a potentiality whose manifestation *includes* or *makes true p*, with Borghini and Williams 2008.) When a canonical expression is needed, however, I will use the sentence operators 'it is true in virtue of X's essence that ...' and 'X have a potentiality for it to be the case that ...', and I will occasionally (for abbreviation) formalize these using subscripted modal operators, $\Box_X$ and $\Diamond_X$. Although the predicate operator may be, as Fine (1995c) notes for essence, 'the basic form of expression', it is for our purposes 'not the most convenient' (Fine 1995c, 55).

## 2.  Essence and Potentiality

The goal of this section is to examine the relation between essence and potentiality. §2.1 will argue that the two are not duals; §2.2 will introduce, explain and defend the claim that they are semi-duals; §2.3 will discuss how these arguments apply to iterated potentiality.

### 2.1  Against Duality

Essence and potentiality seem to be closely related, in much the same way as necessity and possibility are related. Necessity and possibility are, of course, duals. So our first question is: are essence and potentiality, like necessity and possibility, just duals of each other and hence interdefinable?

Let us start by considering the hypothesis that essence and potentiality are simply duals:

**Duality**  (a) X have a potentiality for *p* to be the case iff it is not true in virtue of X's essence that not *p* ($\Diamond_X p \equiv \neg\Box_X \neg p$);
(b) It is true in virtue of X's essence that *p* iff it is not the case that X have a potentiality for not-*p* to be the case ($\Box_X p \equiv \neg\Diamond_X \neg p$).

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(I have given both versions of the Duality claim, although of course they are equivalent. We might find either notion better suited to serve as our basic term and define the other in terms of it.)

A preliminary observation that might shed some initial doubt on Duality is that potentiality, unlike essence, comes in degrees: an object can be more or less fragile, say, but not more or less essentially human. But as long as we read 'potentiality' in Duality as 'potentiality of any degree', this observation does not provide us with a counterexample; it merely shows that there is more to the phenomena than captured in Duality.

Be this as it may, it seems clear that Duality, as it stands, is false. I will give three kinds of counterexamples. Each counterexample will serve not only to refute Duality, but also to bring out important disanalogies between essence and potentiality (hence it is worth going through all three).

**First counterexample: time.** Potentiality, unlike essence, changes over time. I once had the potentiality to be a child prodigy but, having grown up, I have now lost that potentiality (see Vetter 2015, 184). Likewise, a chunk of ice when melted loses its potentiality to break, and when frozen again regains it; and the pianist Paul Wittgenstein (Ludwig's brother), in losing his right arm, lost not just the ability but the potentiality to play a piano concerto for two hands.[4] [5] However, at no point in time do essences change so as to exclude my being a child prodigy, the melted water's breaking, or Paul Wittgenstein's playing a concerto for two hands – essence, after all, is unchangeable. Thus Duality fails in the right-to-left direction of both versions, from negative to positive: at any given time, the lack of an essential property does not endow objects with the corresponding potentialities, nor does the lack of a potentiality at a time endow them with the corresponding essential property.[6]

**Second counterexample: objects.** A core tenet of essentialists is that an ob-

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[4]That, at any rate, is how potentialities are typically understood (see Martin 1994 for dispositions, Vetter 2015, ch. 5.8 for potentiality). Could we instead take potentiality to be timeless and only its manifestations to be time-indexed – thus Paul Wittgenstein timelessly has the potentiality to play-two-handedly-before-1914, and timelessly lacks the potentiality to play-two-handedly-after-1914? Perhaps; but the counterexample in the main text would still go through. For Paul Wittgenstein's essence should not exclude his playing two-handedly either before or after 1914. (Not, that is, unless an object's entire history is encoded in its essence. That is a view, however, which few will hold today.) – Thanks to the editor and an associate editor of *Mind* for pressing me to clarify this (and to come up with better examples).

[5]Question: How, then, does the potentialist account for its *now* being metaphysically possible that I should have been a child prodigy? Answer: by generalizing time out of her definition: it is metaphysically possible that *p* just in case some things *have, had or will have* a suitable potentiality.

[6]Given axiom (T) for potentiality, my not being essentially some way does endow me with a potentiality: the potentiality to not essentially be that way. (Thanks to an anonymous reviewer for reminding me!) But that is clearly not the potentiality required for (Duality) to hold.

ject's essence does not involve other objects in the indiscriminate way that *de re* necessities about it do. Thus it is not true in virtue of Socrates's essence that Socrates is a member of his singleton; nor is it true in virtue of Socrates's essence that Socrates is distinct from Plato. This is so because neither the singleton nor Plato are part of what it is to be Socrates: neither 'pertain to the essence' of Socrates. When an object does pertain to the essence of another, then we have a case of ontological dependence (Fine 1995b): thus it is true in virtue of the essence of the singleton that Socrates is its member, and accordingly the singleton ontologically depends on Socrates. In order to account for necessities involving two or more objects neither of which pertain to the essence of the other, such as the necessary distinctness of Socrates and Plato, essentialists must, and do, allow for 'collective essence' (Correia 2012, Zylstra 2018a, Morvarid 2018). Thus it is true in virtue of the collective essence of Socrates and Plato together that they are distinct. The collective essence of a number of objects will always preserve the essence of the individuals involved (thus it is true in virtue of Socrates's and Plato's collective essence that Socrates is human), but not vice versa.

Potentiality allows for similar distinctions but behaves differently (Vetter 2015, ch. 4). A given object, such as Socrates, has no *intrinsic* potentialities involving another object, such as a potentiality to be Plato's teacher. Jointly, however, objects do have potentialities (intrinsic to them taken together) to stand in various relations – thus Socrates and Plato jointly have a potentiality to stand in the teacher-student relation. Unlike collective essence, joint potentialities always endow the individual with a potentiality of its own, more precisely: with an *extrinsic* potentiality. Thus Socrates, in virtue of his jointly possessed potentiality with Plato, has an extrinsic potentiality to be Plato's teacher – extrinsic because the possession of the potentiality depends on Plato's existence at the very least. In this way, any objects can have (extrinsic) potentialities involving other objects – nothing plays the role for potentiality here that ontological dependence played for essence (Vetter 2015, 115-122).

This asymmetry now gives rise to our second counterexample, similar to one which I noted already in Vetter (2015, 181f.): it is not true in virtue of Socrates's essence that Socrates is identical with Plato; and it is not true in virtue of Socrates's essence that Socrates is not identical with Plato. Socrates's essence does not involve Plato in any way; it is neutral with regard to Plato. Given Duality, it would follow that Socrates must be potentially non-identical with Plato, and that Socrates must be potentially identical with Plato. While the first is merely counterintuitive, it may be accepted by potentialists (see Vetter 2018). The second, however, is clearly false. Thus we have an asymmetry here in the case of potentiality that is lacking in the case of essence, and another counterexample to Duality's right-to-left direction: it is not the case at any time that Socrates is potentially not distinct from

Plato, yet Socrates is not essentially distinct from Plato. Again, it is the negative that fails to imply the positive.

**Third counterexample: Existence.** Existence is not usually considered an essential property; so for all or most X, it is not true that X essentially exists.[7] It would then follow from Duality that any object whose existence is not part of its essence has a potentiality not to exist. This provides us with another counterexample to Duality, but we must tread carefully: there are senses in which some objects have, and there are senses in which all objects lack, the potentiality not to exist. Let me begin with the former.

In one sense of 'a potentiality not to exist', our entailment may seem to hold: I have a potentiality to die, after all, that is, to cease to exist (assuming that what it takes for me to exist is to be alive); the vase has a potentiality to break, that is, to cease to exist (assuming that what it takes for the vase to exist is for it to be intact), and so forth. This, then, is one sense in which we might say that things do have a potentiality not to exist: they have potentialities to cease to exist.

But there are other readings that we can give to 'the potentiality not to exist': instead of the process of ceasing to exist, we might intend the state of *being non-existent*; again, that state seems not to be excluded by (all or most) things' essences. What can we say about that? In general, when an object has a potentiality for a teleological process, i.e., a process with an end point, such as dissolving in water or crossing a street, we will want to say that the object also has the potentiality to be in the end state, such as being dissolved in water or being on the other side of the street. By parity of reasoning, we might want to say that by having the potentiality to die I also have the potentiality to be dead, and by having the potentiality to break, a vase has the potentiality to be shattered – and hence for a state in which I and the vase, respectively, no longer exist.

But even if this is right, there are limits to an object's potentialities for non-existence. While I may have a potentiality to *reach* the state of not existing, I do not have potentialities to *remain* in it. For a potentiality must be manifested, if at all, by the thing that possesses it (a principle that we shall return to in §2.2), and how would anything manifest a potentiality when that manifestation requires its own inexistence? Thus, assuming again that my existence is tied to being alive, I can have no potentiality for a state which for its entire duration requires my inexistence, say, posthumous fame, since I would never be there to manifest that potentiality. Yet no such state is excluded by my essence.

Perhaps, however, the counterexample comes out clearest when we consider a final sense of 'the potentiality not to exist': the potentiality to *never* (have) ex-

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[7]Even necessitists, who take everything to exist necessarily, have not (to my knowledge) claimed that this holds in virtue of the essence of the objects concerned.

ist(ed). How would anything manifest such a potentiality, since to manifest it the thing would have to have existed in the first place? It seems clear, again, that this is not an option.[8] And yet, again, it seems equally clear that this is not matched by a corresponding fact about essence: it is not part of a contingent object's essence that it should ever exist.

Thus we have isolated two senses of 'potentiality not to exist' in which nothing has such a potentiality: nothing has a potentiality to be in a continued state of non-existence or have properties (such as posthumous fame) which require such a state; and nothing has the potentiality not to exist ever, at all. However, our initial observation about essence still holds even in these senses: it is not part of a contingent object's essence that it should exist at any time, or at all.

Thus we have a third counterexample to Duality: by lacking the potentiality to be non-existent (on at least two readings), objects do not acquire the distinction of essential existence (on the same readings). Again, our counterexample shows that Duality fails in the right-to-left direction, from negative to positive.

### 2.2 Semi-Duality

Essence and Potentiality, it has emerged, are not duals. Note, however, that all the counterexamples of the previous section have challenged only one direction of Duality: the right-to-left implication from a *lack* of essentiality to the *presence* of a potentiality; or conversely, from the *lack* of a potentiality to the *presence* of an essential property. The left-to-right direction has not been challenged by the arguments of 2.1, and that's no accident. For it can be argued that the implication in the opposite direction must hold, because essence constrains potentiality. Here is how.

There are two features that are distinctive of potentiality in general. Potentialities are properties of objects (as opposed to a 'free-floating' mere possibility); and potentialities have manifestations (as opposed to categorical properties, which are merely instantiated or not, but do not allow for a further distinction between manifested/unmanifested instantiation). These two features are related: the object which *has* a potentiality is also the object that *manifests* the potentiality, if and when it is manifested. There is no way for one object to manifest the potentialities of another.

There are, of course, ways for objects to be involved in the manifestation of another object's potentialities; we have seen one such way above, with extrinsic potentiality. But we have also seen that each such extrinsic potentiality must have

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[8]Question: How can the potentialist nevertheless account for possibilities of non-existence? Answer: by appeal to iterated potentialities; see §2.3 and, for discussion, Leech 2017 and Kimpton-Nye 2018.

a basis, a ground, in a potentiality that is possessed jointly by all the objects involved. In Vetter (2015, 153-157), I have argued that such extrinsic potentialities even include those whose manifestation are mere Cambridge properties: thus I might have a potentiality to be such that you are sitting. Even in this case, however, the manifestation of the extrinsic potentiality is minimally tied back to the potentiality-possessing object through the 'to be such that' construction: the manifestation of my potentiality to be such that you are sitting still consists in *my* having a certain, albeit a mere Cambridge, property.

Now, if everything must manifest its own potentialities, then this puts certain boundaries on the potentialities that things might in principle possess. We have seen above that nothing could have a potentiality whose manifestation requires its own inexistence (at all times), for how should anything ever exercise such a potentiality? For the same reason, nothing could have a potentiality to go against its own essence. A thing's essence is what makes it the thing that it is. A potentiality to go against one's own essence is thus a potentiality to not be the thing that one is. But to manifest any such potentiality, a thing would have to fail to be the thing it is, and that in turn is to say that the thing *itself* would not be that which would be exercising the potentiality. Hence nothing could manifest a potentiality to go against its own essence, and therefore nothing possesses such a potentiality. Essence, in short, constrains potentiality. Hence we get the one-way implication that was untouched by my counterexamples to Duality. I propose to call this relation of one-way implication from the positive of one operator to the negative of the other *semi-duality*:

**Semi-Duality** (a) If X have a potentiality for *p* to be the case, then it is not true in virtue of X's essence that not *p* ($\Diamond_X p \supset \neg \Box_X \neg p$);
(b) If it is true in virtue of X's essence that *p*, then it is not the case that X have a potentiality for not-*p* to be the case ($\Box_X p \supset \neg \Diamond \neg p$).

Again, (a) and (b) are equivalent; the implication goes both ways. (Metaphysically, however, the situation appears to be less symmetric: I have argued that essence constrains potentiality; I have provided no argument that potentiality constrains essence. I will say a little more on the metaphysical picture in 4.3.) Unlike Duality, Semi-Duality does not provide us with a reason to think that essence and potentiality are 'two sides of the same coin', two facets of the same phenomenon. Together with the failure of Duality, it rather suggests that essence and potentiality are two distinct, but interestingly linked, phenomena.

*2.3 Iterated Potentiality and Essence*
Since we are interested in comparing the essentialist and the potentialist account of modality, we need to take a look not merely at potentiality but at *iterated poten-*

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*tiality*. After all, the potentialist account explains modality in terms not simply of potentiality, but of iterated potentiality.

Iterated potentialities are potentialities for something to have a potentiality (for something to have a potentiality to ... and so forth) (Vetter 2015, ch. 4.6). Thus a quantity of liquid water has no potentiality to break; but it does have the potentiality to be frozen and to thus acquire the potentiality to break; it has an *iterated* potentiality to break. I have no potentiality for posthumous fame, as we saw above; but I have a potentiality to produce, say, a work of art with the potentiality to become widely-known and strongly associated with my name after my death; thus I have an *iterated* potentiality for posthumous fame.[9] Note that we can think of potentiality simpliciter as a limiting case of (once-)iterated potentiality.

Iterated potentiality is no more the dual of essence than potentiality simpliciter is. Consider again our three types of counterexamples. First, potentiality changes over time, while essence does not. The same holds for iterated potentiality. I now have the iterated potentiality for my great-granddaughter to be a dancer (I have a potentiality to have a child, with the potentiality to have a child, with the potentiality to have a daughter, with the potentiality to be a dancer). At a certain age, however, I will lose that potentiality together with my potentiality to have children in the first place. My essence, however, should remain untouched: it never has excluded, and never will exclude, that I have a great-granddaughter who is a dancer. Second, objects: although Socrates' essence does not include his distinctness from Plato, Socrates has no potentiality not to be distinct from Plato; this holds for iterated potentiality just as well. Only our third counterexample from 2.1 requires a short hedge: objects may have iterated potentialities for manifestations that involve their own inexistence, such as the above-mentioned iterated potentiality for posthumous fame. But it will still be true that nothing has even an iterated potentiality *never* to exist. We can think of an iterated potentiality as a chain of potentialities, each embedded in the previous one. Thus the object that has the potentiality which is the first link in our chain need not be the object that manifests the potentiality which constitutes the final link in the chain. But if the iterated potentiality is to be manifested, its manifestation must still start with the possessor of that first potentiality, and hence requires its existence at least at some point in time.

It should be clear, then, that essence and iterated potentiality are no more duals than essence and potentiality simpliciter.

But are essence and iterated potentiality also semi-duals? Can the reasoning from 2.2 be extended to iterated potentiality: is an object's (or objects') iterated

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[9]I am assuming that posthumous fame consists of one's name being widely known (and perhaps associated with some achievement) after one's death, to circumvent difficult issues about attributing properties – such as fame – to non-existent individuals.

potentiality constrained by its essence?

Here we must draw a distinction between two kinds of iterated potentiality. Every iterated potentiality is, as it were, a chain each link in which is a potentiality embedded in the preceding link. Now these embedded potentialities might all have the same bearer, as in the case of the water's iterated potentiality to break: X has a potentiality for X to have a potentiality for X to have a potentiality ... and so on. We might call this a *constant* iterated potentiality. But the embedded potentialities might also have different bearers, albeit linked through joint potentialities: X has a potentiality for X+Y to have a potentiality for Y to have a potentiality for ... and so on.[10] This was the case in the above example of my iterated potentiality (X being me, Y the artwork that I have a potentiality to produce) for posthumous fame above, and we can call it *variable* iterated potentiality. Further examples include: a violin teacher having the potentiality to induce in her student the potentiality to play the violin well, and hence having the iterated potentiality for the student to play the violin well; or a freezer's potentiality to freeze a quantity of water, making it breakable, and hence the iterated potentiality for the quantity of ice to be broken. (The examples are from Vetter 2015, ch. 4.6, but I did not there distinguish explicitly between constant and variable iterated potentialities.) Note that in these cases, the immediate manifestation (the teacher teaching the student, the freezer freezing the ice) of such an iterated potentiality, the first link in the chain, can still be thought of as involving the iterated potentiality's bearer; while the ultimate manifestation (the pupil playing well, the frozen water breaking) cannot.[11] In fact, the ultimate manifestation can take place without the bearer of the initial iterated potentiality existing (as in the case of my iterated potentiality for posthumous fame), and can involve objects that do not (yet, or – if the iterated potentiality remains unmanifested – ever) exist while the iterated potentiality is possessed, such as my great-granddaughter. Thus variable iterated potentiality greatly expands the reach of potentialities, and is crucial for potentialism to succeed in capturing all the metaphysical possibilities that there are.

Now, it can easily be shown that essence contrains *constant* iterated potential-

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[10]I am using 'Y' as standing for a proper name here, but it may instead be replaced with an existentially quantified variable, see Vetter 2015, ch. 4.6. We need X to be involved (hence the 'X+Y'), to respect the constraint that everything manifest its own (non-iterated) potentialities, as set out in §2.2.

[11]Given axiom (T) for potentiality, whenever objects X have some potentiality to Φ, and hence objects Y are such that X have a potentiality to Φ, it follows that Y have a potentiality to be such that X have a potentiality to Φ – i.e., Y have an iterated potentiality for *X* to Φ. Thus what we have seen in the more ordinary cases mentioned in the main text does not hold universally: the bearer of a variable iterated potentiality need not be involved in the manifestation of *any* stage of its iterated potentiality in any more than the minimal way that is required for possessing a Cambridge potentiality (see 2.2). Thanks for an associate editor of *Mind* for pressing me on this.

ity, given standard assumptions on the logic of essence. For the logic of essence is generally taken to conform (with some restrictions that are irrelevant to present purposes) to an S5 logic, and hence to include the equivalent of the S4 principle: if it is true in virtue of X's essence that $p$, then it is also true in virtue of X's essence that it is true in virtue of X's essence that $p$. (In Correia 2000, this is theorem II.1(v), proved on pp. 299f.; it is not proved in, but follows equally from the principles of, Fine 1995a.) Given the S4 principle for essence, it is easy to see that essence constrains every link in a constant iterated potentiality. For given that it is true in virtue of X's essence that $p$, it will also be true in virtue of X's essence that $p$ is true in virtue of X's essence. And if that is so, then X must not only lack the potentiality for $p$, but also the potentiality for it not to be true in virtue of X's essence that $p$; and this in turn implies that X must lack the potentiality to have the potentiality for not-$p$. The same holds, of course, for any number of iterations. So we get semi-duality for essence and constant iterated potentiality: If it is true in virtue of X's essence that $p$, then X have no constant iterated potentiality for not-$p$.

With *variable* iterated potentiality, things are a little more complicated. For a thing's variable iterated potentiality need not be manifested by the thing itself – that is why we can have iterated potentialities of this kind for manifestations that involve the bearer's continued non-existence, such as posthumous fame. And so our initial reasoning, starting as it did with the consideration that potentiality must be manifested by its possessor, seems to have little bearing on this kind of case. Nor does the S4 principle for essence help us, for it applies only to the iterations of what is true in virtue of the same thing or things.

Nevertheless, semi-duality can be argued to hold between essence and variable iterated potentiality as well, given certain assumptions on essence. (Or, if these assumptions are dropped, semi-duality can be argued to hold with regard to a restricted class of cases – those which conform to the assumptions.) The main assumption is what Wilsch (2017, 436) calls the 'bearer-constraint' for essence (see also Morvarid 2018): that the bearer of an essence is always part of the content of the proposition that is true in virtue of its essence. Thus if it is true in virtue of the essence of X that $p$, it would follow that $p$ is 'about' X, that X are among the 'objectual content' (Fine 1995a) of $p$. I will adopt this assumption for present purposes, but a reader who disagrees with it may read the following argument as restricted to the cases where it holds.[12]

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[12]Fine allows for cases that would violate the bearer-constraint: he allows, for instance, for it to be part of Socrates's *consequential* essence that everything is self-identical; and of singleton Socrates's *mediate* essence that Socrates is human; see Fine 1995c. The principle of Monotonicity, which we shall discuss in a moment, might also seem to violate the bearer-constraint, for it seems to generate cases where a proposition, $p$, is true in virtue of some objects (e.g., it is true in virtue of the collective essence of Socrates and Plato that Socrates is human) but only some of these objects (in our case,

There are two further assumptions that we will need to show semi-duality for iterated potentiality, one concerning essence and one concerning potentiality.

**Monotonicity of Essence**  If X are among the Y, then: if it is true in virtue of X's essence that *p*, then it is true in virtue of Y's essence that *p*.

**Potentiality Dependence**  If Y have an iterated potentiality for $\phi(X)$, then there are objects Z such that both X and Y are among the Z, and Z have an iterated potentiality for $\phi(X)$,

where '$\phi(X)$' stands for an arbitrary sentence in which 'X' occurs.

Monotonicity of Essence informally states that essences do not 'get lost' in composition: the collective essence of Socrates and Plato, *what it is* for any two things to be Socrates and Plato, will include what it is for any one object to be Socrates, i.e., Socrates's individual essence. The principle is part and parcel of the logic of essence; as Zylstra (2018a) notes, it is assumed without argument in Fine 1995a and other treatments of the logic of essence (e.g., Correia 2000, Correia 2012), and is used there in the derivation of a great many theorems. Zylstra (2018a) provides an extensive philosophical defence of the principle.

Potentiality Dependence arises from the metaphysics of extrinsic and joint potentialities that we have seen at work in §2.1. Suppose that some objects, Y, have a potentiality for X to be some way, say $\phi(X)$. Then we can distinguish two cases. First, X are (wholly) among the Y (including the case where X are identical with Y). In this case, the principle is trivially satisfied. Second, X are not (wholly) among the Y. Then Y's potentiality for X to be some way must be *extrinsic* – it depends, at the very least, on X's existence. If there were no such thing(s) as X, then Y could have no potentiality concerning X. But such extrinsic potentialities, I have argued in Vetter (2015, 130-135), always depend on the *joint* potentialities that are intrinsic to X and Y jointly – hence the plurality of X and Y together must have a potentiality for $\phi(X)$, and the consequent of Potentiality Dependence must be true. The argument applies whether or not the potentiality in question is iterated[13], thus yielding Potentiality Dependence.

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Socrates) are part of the proposition's objectual content (see Zylstra 2018a for discussion). However, it has been argued (Hale 2013, ch. 9, see also Fine 2015 for related considerations) that ascriptions of essence in general should include reference to the identity of the the thing(s) whose essence is in question. Thus strictly speaking, what is true in virtue of Socrates's essence is not that Socrates is human, but that everything which is identical to Socrates is human. Correspondingly, even the monotonicity-induced claim '$\Box_{S,P}$ (Socrates is human)' ought to be rephrased as '$\Box_{S,P}$ ($\forall$X (If X = Socrates and Plato, then X are such that Socrates is human))', thus containing its full bearer in the objectual content of the embedded proposition. (This would require a rephrasing of the principle of Monotonicity given in the main text.)

[13]To see why, consider that extrinsicality is the same for iterated or non-iterated potentiality: nothing could have any potentialities, iterated or not, concerning *Socrates* unless Socrates existed. (We

Now we are ready to show how essence constrains even variable iterated potentiality. Assume that for some X and some $p$, it is true in virtue of X's essence that $p$. Given the bearer-constraint, $p$ will have the form $\phi(X)$, for some open sentence $\phi$. Now assume (for reductio) that X also have an iterated potentiality for it to be the case that not-$\phi(X)$. For the reasons given above, this cannot be a constant iterated potentiality (of the form $\Diamond_X \Diamond_X \Diamond_X ... \neg\phi(X)$); rather, it must be a variable iterated potentiality (of the form $\Diamond_X \exists Y \Diamond_{X+Y} \Diamond_Y ... \neg\phi(X)$). But even if the bearers of the embedded potentialities vary, the final potentiality in the chain must be a potentiality for *X* to be some way, or rather not to be some way ($\neg\phi(X)$). Given Potentiality Dependence, then, the final potentiality in the chain will either be, or will entail, a potentiality possessed by some objects Z that include X, for it to be the case that $\neg\phi(X)$. By Monotonicity, any such objects Z, in virtue of including X, will be essentially such that $\phi(X)$. Hence, by Semi-Duality (for non-iterated potentiality), Z must *lack* a potentiality for $\neg\phi(X)$. This holds, not merely as a matter of fact, but as a matter of the logic of essence and potentiality; hence it would still hold if X were to manifest its hypothetical iterated potentiality for $\neg\phi(X)$. But that in turn means that this hypothetical iterated potentiality could never be manifested. Hence there cannot be an iterated potentiality whose final link consists in a potentiality for $\neg\phi(X)$ – in other words, X cannot have an iterated potentiality, even of the variable kind, for not-$p$.

I conclude, then, that the results we have obtained for essence and potentiality in sections 2.1-2.2 can be extended to iterated potentiality: essence and iterated potentiality are not duals, but semi-duals, since essence constrains iterated potentiality. At least, this is true when we assume the bearer-constraint; if that constraint is rejected, then we can only say that essence constrains constant iterated potentiality and variable iterated potentiality *if* it conforms to the bearer constraint.

We can thus state the relation between essence and iterated potentiality (abbreviated as '$\Diamond*_X$') in a hypothetically restricted form, leaving open whether or not the condition in brackets amounts to a genuine restriction:

**Semi-Duality\*** (Where $p$ is of the form $\phi(X)$:)
> (a) If X have an iterated potentiality for $p$ to be the case, then it is not true in virtue of X's essence that not $p$ ($\Diamond *_X p \supset \neg\Box_X \neg p$);
> (b) If it is true in virtue of X's essence that $p$, then it is not the case that X have an iterated potentiality for not-$p$ to be the case ($\Box_X p \supset \neg\Diamond *_X \neg p$).

In what follows, I will use the expression 'the semi-duality of essence and

potentiality' to refer to the results of 2 overall: the failure of Duality together with Semi-Duality and Semi-Duality*.

## 3.   Against Combination

In the previous section, we have seen that essence and potentiality are not interdefinable, though they are interestingly linked by semi-duality. Essence and potentiality are not, as necessity and possibility are plausibly thought to be, merely two sides of the same coin. If this is true, then essentialism and potentialism, too, are distinct theoretical options.

The question may still arise, are those distinct theoretical options natural competitors? Or are they not rather natural allies? That is to say, could we not combine essentialism and potentialism so as to yield a theory that combines the strengths of both accounts? Essentialism and potentialism are, after all, focussed on different parts of modal space. Essentialism, we might say, is *necessity-first*: it gives us a positive story about necessities, and thinks of possibilities as simply whatever is left open by the necessities. Potentialism, on the contrary, is *possibility-first*: it gives us a positive story about possibilities, and thinks of necessities as simply marking the boundaries of possibility. Why not combine the two positive stories? Moreover, essentialism appears to be the most successful when dealing with necessities that concern abstract objects, such as numbers or sets, where we can clearly make out the essences and the story to be told about the necessities. Potentialism appears to be the most promising when dealing with everyday possibilities, of glasses breaking and individuals becoming dancers; it has certainly faced some challenges with respect to the realm of the abstract (Yates 2015), and is sometimes explicitly restricted to the realm of concrete objects (Jacobs 2010, 240). Again, why not combine the two, pool their virtues and hope to thereby eliminate the vices?

Why not indeed? The answer, simply stated, is this: because the mere semiduality of essence and potentiality would leave the full-blown duality of necessity and possibility unexplained. Let me elaborate.

There are two ways of combining essentialism and potentialism so as to capture the motivation I have given. On a first version, we account for all the necessities in terms of essence, and all the possibilities in terms of iterated potentiality. On a second version, we account for some necessities in terms of essence, and the corresponding possibilities in terms of a lack of constraint by essence; and we account for some possibilities in terms of iterated potentiality, and the corresponding necessities in terms of a lack of iterated potentiality. (Both options will count as 'modal pluralism' in the sense of Mallozzi ms.)

One might think that there is a third version, at least available in logical space,

which accounts for each modal truth *both* in essentialist and in potentialist terms. A possibility that *p*, on this view, would be a matter of something having an iterated potentiality for *p and* nothing's being essentially such that not-*p*, and *mutatis mutandis* for necessity. But the first (positive) conjunct, by Semi-Duality*, will always entail the second (negative) one, which thereby becomes redundant. And so we can see that such a 'conjunctive' view is not in fact a distinct option: it collapses into the first version of the combined view. I will therefore limit my discussion to the first and the second version that I have outlined.[14]

Let us begin by looking at the first version of a combined account, and assume that we defined possibility in terms of iterated potentiality, and necessity in terms of essence. We would then still want to have the result that it is not possible that not *p* iff it is necessary that *p*. That is: we would want to say that nothing has an iterated potentiality for not-*p* iff something is essentially such that *p*. But there is no reason for accepting the left-to-right version of this biconditional: the lack of a potentiality, iterated or not, as we have seen above, does not imply that anything whatsoever have the corresponding essential property. Likewise, we would want to have the result that it is not necessary that not *p* iff it is possible that *p*; i.e., that nothing is essentially such that not-*p* iff something has an iterated potentiality for *p*. But, again, the left-to-right direction of this biconditional is unjustified: there is no implication from the lack of an essence to the possession of a corresponding potentiality, iterated or not.

On the first version of the combined view, then, the duality of necessity and possibility would either have to be given up, or to remain an utter mystery, to be stipulated without justification. I take this to be reason enough for rejecting this version of the combined view.

The second version of the combined account is a kind of 'source-based modal pluralism' (Mallozzi ms; note, however, that Mallozzi considers and advocates a different version of source-based pluralism). On this view, it is possible that *p* iff something has an iterated potentiality for *p or* it is not the case that anything is essentially such that not *p*; and it is necessary that *p* iff something is essentially such that *p or* it is not the case that anything has an iterated potentiality for not *p*. Logically speaking, this version (like the apparent third option that we set aside above) collapses into a simpler view: since, by Semi-Duality*, the 'positive' disjunct in each definiens entails the negative (but not vice versa), the disjunctive definientia are each equivalent to their negative disjunct. Thus our definitions are equivalent to the simpler and somewhat surprising: it is possible that *p* iff it is not the case that anything is essentially such that not *p*; and it is necessary that *p* iff it is not the case that anything has an iterated potentiality for not *p*. Metaphysically speak-

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[14]Many thanks to an associate editor of *Mind* who brought this to my attention.

ing, however, we will still want to retain both disjuncts. For on this version of the combined view, the *grounds* of possibility and necessity are still of two different kinds: in some cases, a necessity is grounded in an essence (which entails, but does not reduce to, the lack of any contravening potentiality), while in other cases, a necessity is grounded solely in the lack of any contravening potentiality.[15]

This version offers two sources for necessity and for possibility, with largely overlapping results. One unattractive feature of the metaphysical story is that it will lead to overdetermination in all or almost all cases of modal truths. For what, on this view, is the source of a given possibility: the potentiality or the lack of a contravening essence? What is the source of a given necessity: the essence or the lack of contravening potentialities? We might say that the positive (an essence, a potentiality) takes precedence, and the negative (a lack of contravening essence or potentiality) counts as a source of necessity/possibility only in the absence of a positive source. Even if this could be made to look non-ad hoc, we would still be faced with a second and related problem. For how is it that both the existence of a potentiality, and the absence of a contravening essence, give rise to the same kind of fact, a possibility? How is it that both the existence of an essence, and the absence of a contravening potentiality, give rise to the same kind of fact, a necessity? What is it that the positive and the negative fact in both of these cases have in common? If there is any answer to these questions, we may well suspect, that answer would be what gives us the real account of modality; and if there is none, then it remains unclear why it is that we would harness these two notions together in such a way.

What is worse, this second version still does not give us the duality of necessity and possibility. As we have seen above, it is logically equivalent to a definition that uses only the negative disjuncts: it is possible that $p$ iff it is not the case that anything is essentially such that not $p$; and it is necessary that $p$ iff it is not the case that anything has an iterated potentiality for not $p$. In symbols, the duality claim $\Diamond p \equiv \neg\Box\neg p$ would then translate as $\neg\exists X \Box_X \neg p \equiv \neg\neg\exists X \Diamond *_X \neg\neg p$, or, eliminating the double negations, as $\neg\exists X \Box_X \neg p \equiv \exists X \Diamond *_X p$. But that equivalence is simply the duality of essence and (iterated) potentiality with existential quantifiers added in! And we have no more reason to accept it than we do to accept the duality of essence and iterated potentiality itself.[16]

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[15]Note that the same reasoning does not apply to our dismissed third version, where the positive ground is required to be present in all cases, and the negative has no independent role to play in grounding the modal truth.

[16]The original disjunctive definition, incidentally, does no better, but for a different reason. For possibility and necessity, on this view, are each defined in terms of a disjunction. Their duality would thus require that a disjunction (say, of essentially $p$ or not-potentially-not $p$) is equivalent to a negated disjunction (not: potentially not $p$ or not-essentially-not $p$). But a negated disjunction is equivalent to a conjunction, and hence stronger than a (non-negated) disjunction. It does not help that one disjunct in each disjunction is the dual of one disjunct in the other, for the truth of the

I submit that these considerations make the combined view, in either version, deeply problematic. Essentialism and potentialism each have a better chance when going it alone. It would go beyond the confines of this paper to adjudicate the dispute between them. I will, however, finish by pointing out how semi-duality can make a contribution to this dispute.

## 4. An Application

### 4.1 The Explanatory Challenge

In this section, I want to point out how the semi-duality of essence and potentiality can be applied to help the potentialist respond to an underdeveloped, but real, challenge, which I will call 'the explanatory challenge'.[17]

As an account of modality, potentialism is meant not only to be extensionally adequate, but to provide an *explanation* of the modal facts. It is possible that I should have been a carpenter *because* of the various abilities and dispositions that I (and others) have or had. The challenge is simply to show that these explanations be good *qua* explanations. And this challenge becomes pressing when we look at the potentialist account of necessity.[18]

According to potentialism, as we saw above, necessities simply mark the limits of potentiality: what is necessarily true, is so simply because there is no iterated potentiality to the contrary. Thus it is necessarily the case that I have the parents I do because nothing has any (iterated) potentiality for me to have different parents; it is necessary that 2 is prime because nothing has an iterated potentiality for it not

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negated disjunction would require the falsity of both its disjuncts. Read $\Diamond p$ as 'some things have an iterated potentiality for $p$' and $\Box p$ as 'it is true in virtue of the essence of some things that $p$'. Then we have $\Box p =_{df} \boxdot p \lor \neg \Diamond \neg p$, and also: $\Diamond p =_{df} \neg \boxdot \neg p \lor \Diamond p$. To show the duality of necessity and possibility, i.e., $\Box p \equiv \neg \Diamond \neg p$, we would have to show the duality of their definientia: $(\boxdot p \lor \neg \Diamond \neg p) \equiv \neg(\neg \boxdot p \lor \Diamond \neg p)$. The truth of the left-hand side of the equivalence guarantees that one of the disjuncts in the negated disjunction on the right-hand-side is false (whichever disjunct is true on the left-hand side, it will entail the falsity of its negated counterpart in the right-hand-side disjunction), but not that both are. Hence the left-hand side fails to entail the right-hand side, and the equivalence fails.

[17]I have not yet seen this objection in print, but have often heard it raised in philosophical conversations – unsurprisingly, since it is a very natural concern about potentialism. Wang (2015) and Wang (2020) raises a number of distinct objections to potentialism, which also concern its explanatory power.

[18]Essentialists may well be facing an explanatory challenge of their own: thus Noonan (2018) and Wilsch (2017) argue, in different ways, that there is an explanatory gap between essence and necessity. It might even be thought that my argument in what follows would help the essentialist address this challenge, since I will show in 4.2 how to derive necessity from essence. But since my derivation is based on the assumption of potentialism, it would be of little help to the essentialist; and I see no other way in which the relation with potentiality would help the essentialist close this explanatory gap (if it exists). Hence I will not discuss this kind of challenge further.

to be prime; and so forth. Even if the potentialist account can give us all (and only) the right necessities,[19] we may feel that it has not provided the right, or indeed any, explanation of those necessities. In fact, the potentialist may seem faced with a Euthyphro question: is 2 necessarily prime because nothing has a potentiality to the contrary? Or is it not rather *because* of the necessity of 2's being prime that nothing has any potentiality to the contrary? If we feel that necessities *constrain* the potentialities that things can have, then we cannot at the same time think that the potentialities, or rather their boundaries, are what determines the necessities.

The problem does not apply to all necessities. Thus I have argued that potentialism can give an account of the necessity of origin by appealing to the temporal asymmetries of potentiality itself (Vetter 2015, 205f.), and of the necessity of identity by appealing to the insensitivity of potentiality towards representational guises such as different names (Vetter 2015, 203f.). But even so, the necessities of mathematics, logic, and the necessity of kindhood remain problematic.

What is worse (for the potentialist), the problematic necessities are precisely those that the essentialist seems to find it easiest to accommodate: the number 2 is necessarily prime because that's part of its nature; logical connectives are necessarily subject to certain rules of inference because that is their essence; and Socrates is necessarily human because he is essentially human. In short, the necessities that are problematic for the potentialist can be explained as arising from the essence of the objects that they are about.

One may think, then, that the essentialist has an explanatory edge here, and since essentialism shares several of the attractions of potentialism this is a particularly pressing problem for the potentialist.

I now want to argue that the problem can be solved given the relation between potentiality and essence that I have outlined above. In effect, the potentialist can 'piggy-back' on the essentialist's explanations of these necessities, without thereby committing to the truth of essentialism as an account of modality. The plan is this: 4.2 shows how, given potentialism, we can derive the necessity of a proposition from its being true in virtue of something's essence. 4.3 explains how this helps the potentialist.

*4.2 Deriving Necessity from Essence*

In order to show that essence entails potentialist necessity, we can adapt an argument given above for the constraining of iterated potentiality by essence. To run the argument, we will again need three general principles, familiar from 2.3:

**The bearer-constraint** If it is true in virtue of X's essence that $p$, then the objectual content of $p$ includes X (i.e., $p$ is of the form $\phi(X)$).

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[19]For a discussion of whether that is the case, see Yates 2015, Vetter 2018, Yates 2020.

**Monotonicity of Essence**  If X are among the Y, then: if it is true in virtue of X's essence that *p*, then it is true in virtue of Y's essence that *p*.

**Potentiality Dependence**  If Y have an iterated potentiality for $\phi(X)$, then there are objects Z such that both X and Y are among the Z, and Z have an iterated potentiality for $\phi(X)$.

If you disagree with the bearer constraint, you may again read the argument as restricted to those cases which conform to it. As we have seen in 4.1, those are the cases of interest for potentialist purposes: they are the ones that provide essentialist explanations for the necessities that the potentialist has trouble with. (See footnote 12 above for discussion of the bearer constraint and how it relates to Monotonicity.) I will now argue that in such cases, an essence will not only constrain the iterated potentialities of its bearer, but will constrain the iterated potentialities of everything else as well: if it is true in virtue of X's essence that $\phi(X)$, then not only must X fail to have any iterated potentiality for $\neg\phi(X)$; the same goes for everything else. And if that is true, then essence entails necessity on the potentialist definition.

The astute reader may well have noticed that the argument in §2.3 had no inherent restriction to the iterated potentiality of the essence-bearer(s), X. So we can simply generalize the argument, as follows. (I abbreviate a little, since we have seen the argument above.)  Assume that for some X, it is true in virtue of X's essence that $\phi$. Now assume (for reductio) that *there are some Y* which have an iterated potentiality for it to be the case that $\neg\phi(X)$. But such an iterated potentiality, again, can be thought of as a chain of successively embedded potentialities; and the final potentiality in the chain must be a potentiality for *X* to be some way, or rather not to be some way ($\neg\phi(X)$). Given Potentiality Dependence, this final potentiality in the chain will either be, or will entail, a potentiality possessed by some objects Z that include X, for it to be the case that $\neg\phi(X)$. By Monotonicity, any such objects Z will be essentially such that $\phi(X)$; and hence, by Semi-Duality, Z must *lack* a potentiality for $\neg\phi(X)$. Contradiction! Hence there cannot be any Y with an iterated potentiality whose final link consists in a potentiality for $\neg\Phi(X)$. And that, on the potentialist account, just is to say that it's necessary that $\phi(X)$. In other words: essence entails (potentialist) necessity.

The general picture that emerges from this is the following. Essence constrains potentiality; and since potentiality provides the grounds for modal truths, essence constrains modal truths. More specifically, essence constrains potentiality in such a way that nothing – be it the essence's bearer or anything else – could have a potentiality – iterated or not – to go against it; and so, on the assumption of potentialism, essence constrains potentiality in such a way as to give rise to necessities.

*4.3   Upshot*

In the previous section, we have seen how essence can be shown to entail potentialist necessity. In this section, I want to point out how the derivation helps the potentialist answer their explanatory challenges.

The explanatory challenge for potentialism was this. According to potentialism, it appears that necessities are nothing more than the boundaries of the potentialities that things have – necessity arises where potentiality gives out. But this seemed explanatorily inadequate: it does not seem right to say that 2 is necessarily prime because nothing has a potentiality to the contrary; rather, we think, it is *because* of the necessity of 2's being prime that nothing has any potentiality to the contrary. Necessities, the objection goes, constrain potentialities, not the other way around.

Given the result of the previous section, we can now see a way for the potentialist to answer this explanatory challenge. The general strategy is this. The necessary truths in question are necessary because there is no contravening potentiality; but the lack of contravening potentialities itself is not a brute fact. Rather, it is in turn explained by certain essentialist facts together with the constraining of potentiality by essence.

Does the appeal to essence put the potentialist at a disadvantage, by threatening to collapse into essentialism or one of the combined views? After all, the strategy I have sketched has it that at least some necessities are ultimately explained by essence.

I do not think so. True, essences will play a role in accounting for some necessities. But, first, the potentialist will not think that all necessities are explained in this way. She will claim, for instance, that the necessity of origin is better and more satisfyingly explained by exploiting the temporal asymmetries of potentiality itself (as I do in Vetter 2015, 205f.) than by stipulating that one's parents are somehow part of one's very nature, and that the necessity of identity are at least as well explained by exploiting potentiality's insensitivity to representational guises as it is by incorporating the identity claim into an object's essence. (The same goes for the necessity of analytic truths; see Vetter ms.) In general, different necessities will arise from different features of potentiality: some, such as the necessities of things' origins, from potentiality's temporal asymmetry; some, such as the necessities of mathematics, from potentiality's being constrained by essence; yet others, such as the necessities of identity (and analyticity), from potentiality's non-representational character. While the constraints on potentiality are thus of different kinds, there is one thing that all these cases have in common: and that is, of course, that we have a lack of potentiality.

Second, and following on the final remark of the previous paragraph, on this view essence does not straightforwardly explain necessity: it does so only through

its link with potentiality. What makes the necessities necessary is still that which they all have in common, the absence of a contravening potentiality; the fact that this absence has an explanation itself in potentiality's relation to essence, time, or representation does not make it redundant.

Here is an analogy. Those who believe that modal truths are made true by possible worlds (whether of the Lewisian or the ersatz variety) may still allow that there are some explanations for what is or isn't true in all possible worlds. That no possible world contains a contradiction is explained by (whatever the grounds are of) logic; that no possible world contains married bachelors is explained by (whatever exactly the grounds are of) analyticity. This is not to say that such a possible-worlds view collapses into either a purely logical or an analyticity-based account of necessity, for two reasons. First, on the envisaged account logic or analyticity do not account for *all* the necessities; what all necessities have in common is not their relation to logic or analyticity, but their truth in all possible worlds. Second, the possible worlds theorist may reasonably hold that she has explained what makes logical or analytic truths necessary: their truth in all possible worlds! Logic or analyticity, on her view, are linked with necessity not directly but through their constraining the realm of possible worlds.

Or take an analogy from a different area. A reliabilist theory of knowledge will explain a belief state's being knowledge in terms of its reliable production. But reliability itself is no brute fact. In some cases this reliable production is itself explained by the belief's having been arrived at through cogent reasoning. That is not to say, however, that the reliabilist view somehow collapses into a kind of rationalism or internalism. For, first, this is but one way in which a belief's being reliably produced may be explained, and other cases afford different explanations. And second, on the reliabilist view, it is still the reliable production that explains why the belief counts as knowledge.

If these responses are acceptable for possible-worlds theorists and epistemological reliabilists, then the analogous responses I have suggested on behalf of the potentialist should be acceptable too.[20]

We can bring this out in a different way, and perhaps more clearly, by drawing, albeit with a broad brush, a potentialist picture of how modality, potentiality, and essence fit together.

The potentialist will typically point out that she is not in the business of giving a reductive account of modality as a whole. Rather, she is imposing a certain order on the entire family of modal notions, a family which includes potentiality as well as possibility, necessity, and the counterfactual conditional. Her claim is that within that family, potentiality lies at the root, it provides the foundation for

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[20]Thanks to an anonymous reviewer for pressing me on this.

the other members of the family.

Does essence belong to the family of modal notions as well? Contra my own earlier view in Vetter (2015, 1-3), I suggest the potentialist is better off saying 'no'. Essence, as we have seen earlier, is closely related to such notions as identity, grounding, and dependence. Some attempts have been made recently to understand grounding in terms of essence (Zylstra 2018b, Jago 2018), or vice versa (Rosen 2015), or to understand the two in terms of identity (Correia and Skiles 2017), or to see them on a par as the two basic 'determinative' relations (Fine 2015). This family of notions – call them, with Fine, the 'determinative' family – are clearly distinct from the modal notions. An obvious distinguishing mark is their hyperintensionality; modal notions, including potentiality, appear to be merely intensional (or, at least, closed under logical consequence: Vetter 2015, 170-176).

If essence thus belongs to a different family of notions, at one remove from the modal notions, then appeal to it does not threaten the potentialist's claim that potentiality is the basic modal notion, from which all others can usefully be derived. In fact, it would be fitting on this view that essence constrains the modal package as a whole by constraining its foundation: potentiality.[21]

## 5. Conclusion

In this paper, I have done three things. First, I have clarified the relation between essence and potentiality. While the two are not duals like necessity and possibility, they are semi-duals: since essence constrains potentiality, nothing has (iterated) potentialities to go against its own essence. Second, I have discussed the implications that this has for the relation between essentialist and potentialist accounts of modality, and come to the conclusion that the two are natural competitors, not natural allies. Third, I have argued that the semi-duality of essence and potentiality helps potentialism to respond to an explanatory challenge, which arises poignantly when comparing potentialism with essentialism. Of course, this does not settle the dispute; the competition between potentialism and essentialism is still on. [22]

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[21]The picture I have suggested on behalf of the potentialist is one which might reasonably be said to take the lessons from Fine (1994) very seriously: it divides essence even further from modality than Fine himself.

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